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Hughes

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(54) **MAGNETIC SLAT DEVICE AND KIT CONTAINING THE SAME**

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(72) Inventor: **John Wesley Hughes**, London, OH (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 265 days.

(21) Appl. No.: **14/067,202**

(22) Filed: **Oct. 30, 2013**

Related U.S. Application Data

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A47F 7/00 (2006.01)
F16M 13/02 (2006.01)

(52) **U.S. Cl.**
CPC ***F16M 13/02*** (2013.01)

(58) **Field of Classification Search**
CPC F16M 13/02
USPC ..... 248/37.3, 37.6, 206.5, 309.4; 211/70.1, 211/70.6, 70.7, DIG. 1
See application file for complete search history.

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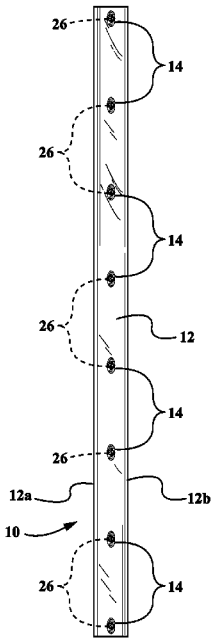
(57) **ABSTRACT**

A magnetic slat device is disclosed herein. The magnetic slat device includes an elongate slat body, the elongate slat body having a generally curved cross-section with a first generally concave surface and a second generally convex surface, the elongate slat body further including a first longitudinal edge portion and a second longitudinal edge portion disposed opposite to the first longitudinal edge portion; and a plurality of magnets coupled to the elongate slat body, each of the plurality of magnets being spaced apart from one another along a length of the elongate slat body, and each of the plurality of magnets being disposed between the first and second longitudinal edge portions of the elongate slat body. Each of the plurality of magnets is configured to exert a magnetic force on a magnetic object. A slat kit comprising a plurality of magnetic slat devices is also disclosed herein.

20 Claims, 18 Drawing Sheets



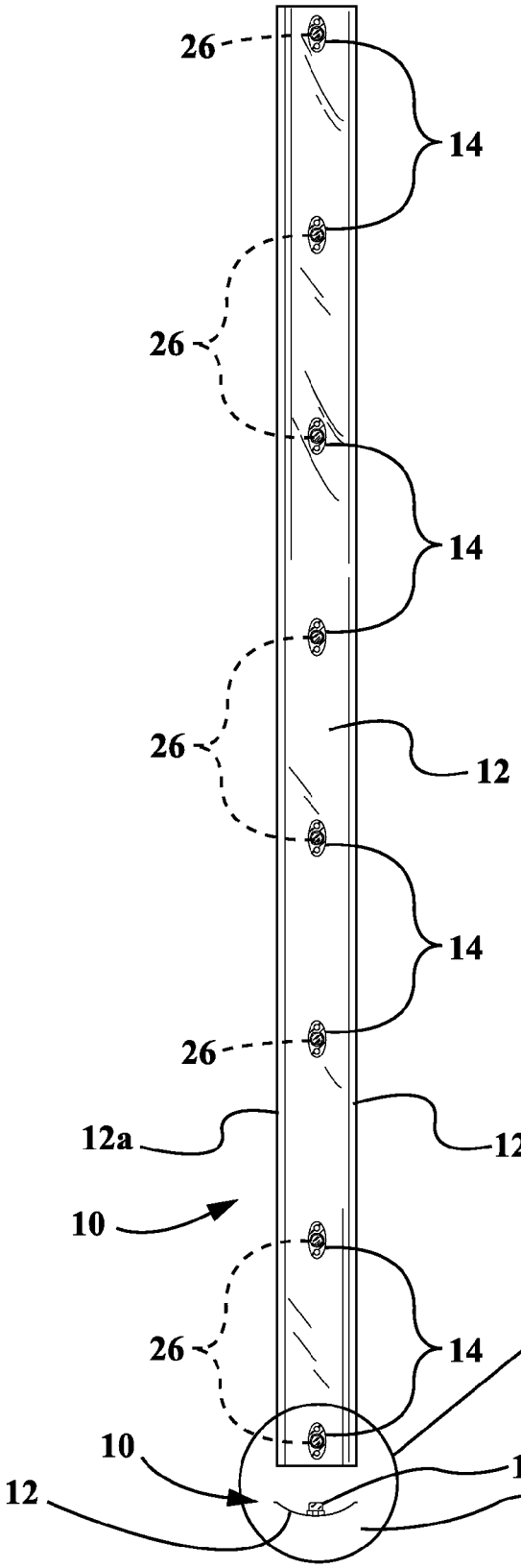


FIG. 1A

FIG. 1B

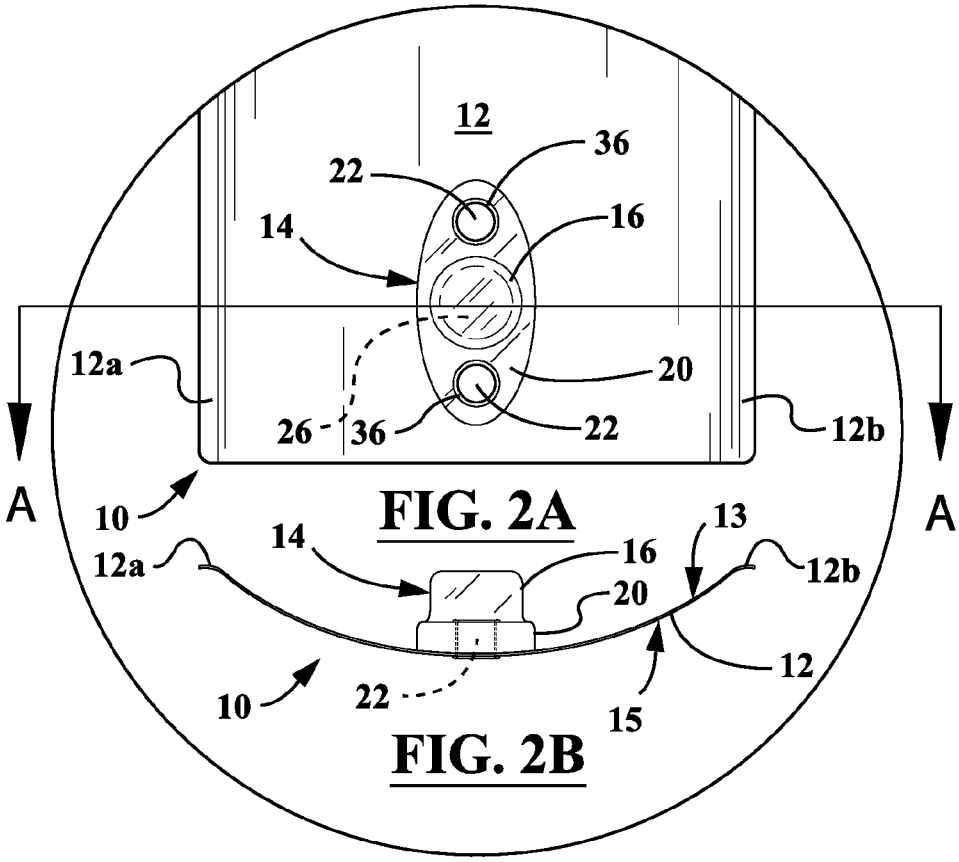
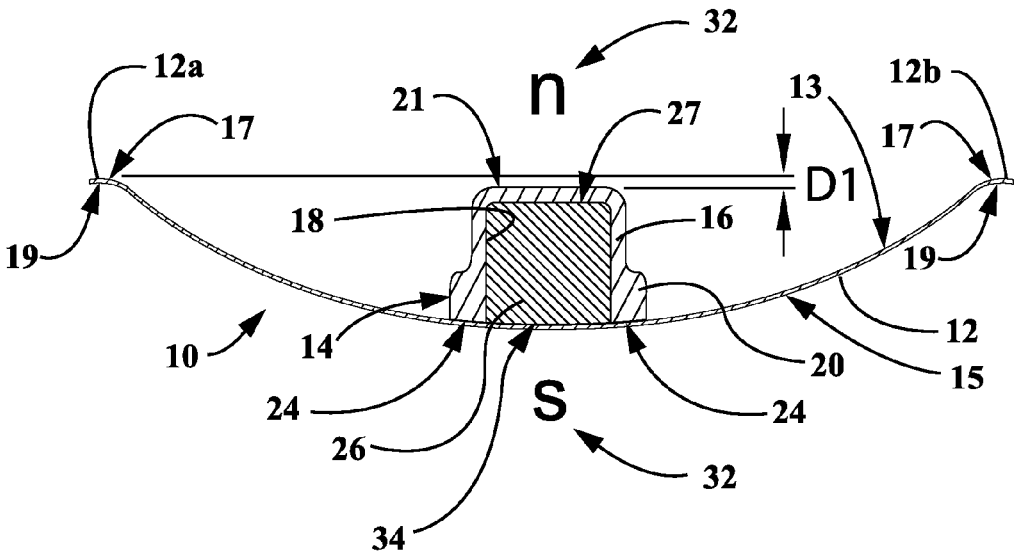


FIG. 2A

FIG. 2B

Detail "A"



Section A-A

FIG. 3

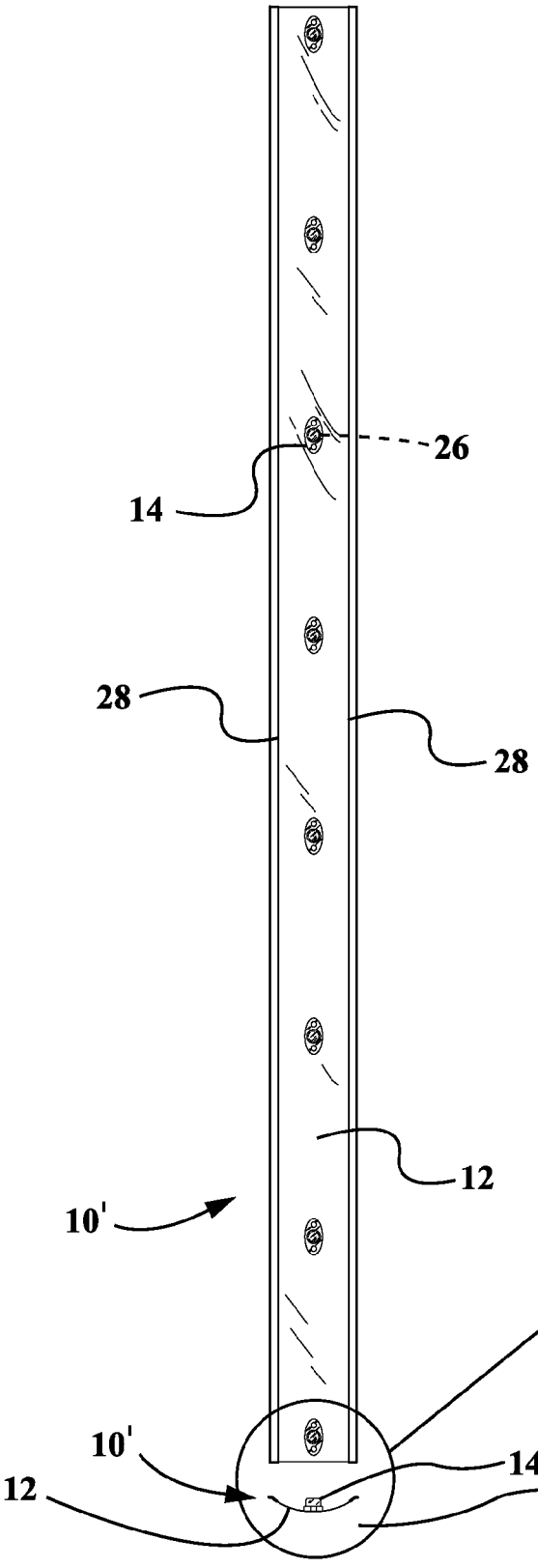


FIG. 4A

FIG. 4B

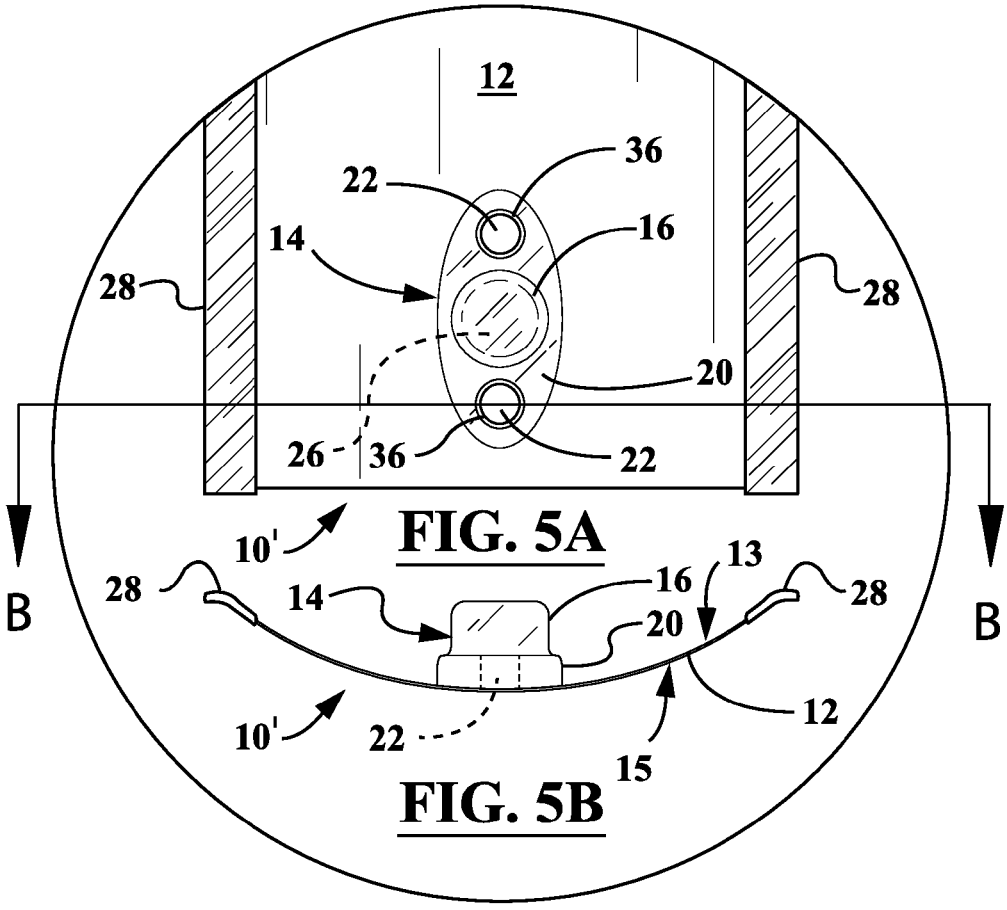
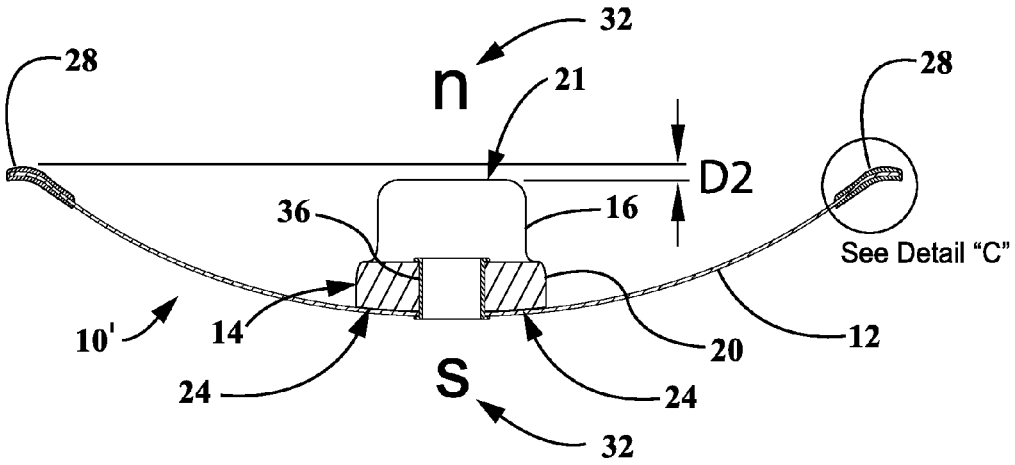


FIG. 5A

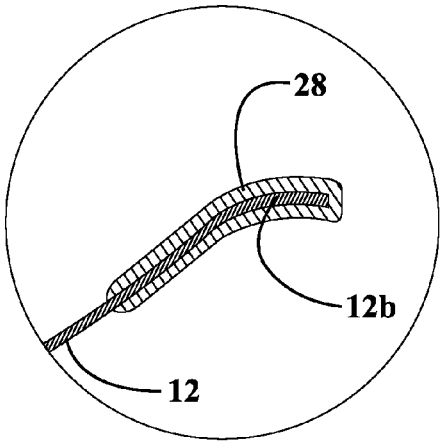
FIG. 5B

Detail "B"



Section B-B

FIG. 6



Detail "C"

FIG. 7

FIG. 8

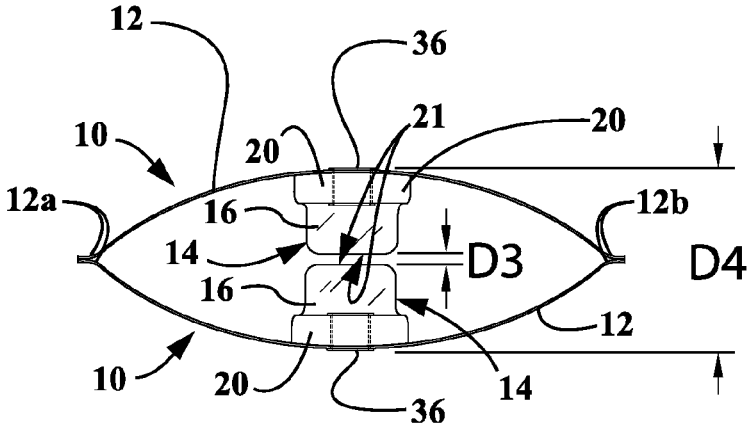


FIG. 9

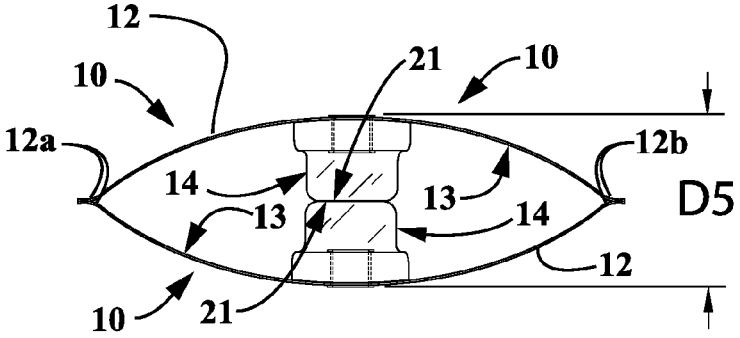
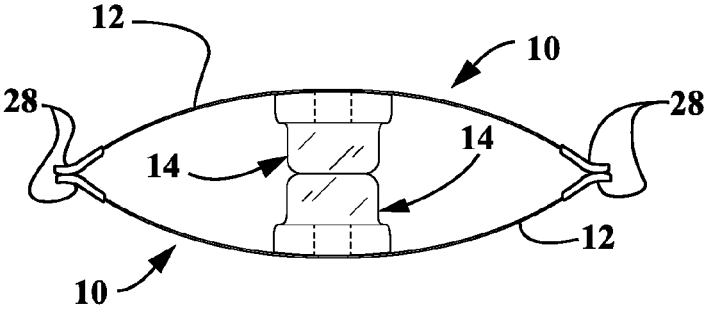


FIG. 10



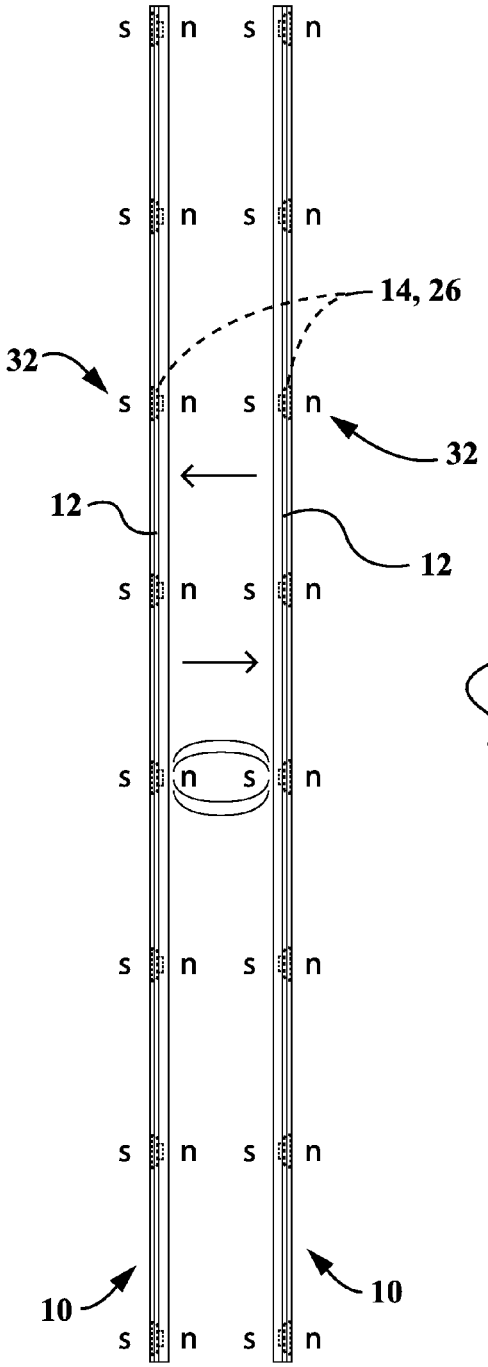

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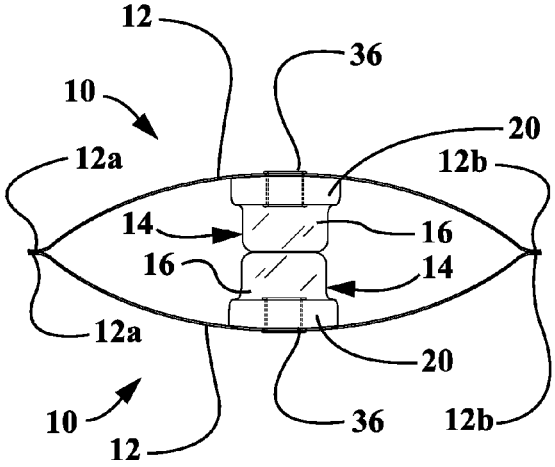
FIG. 11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12a
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36
12b
12

FIG. 12

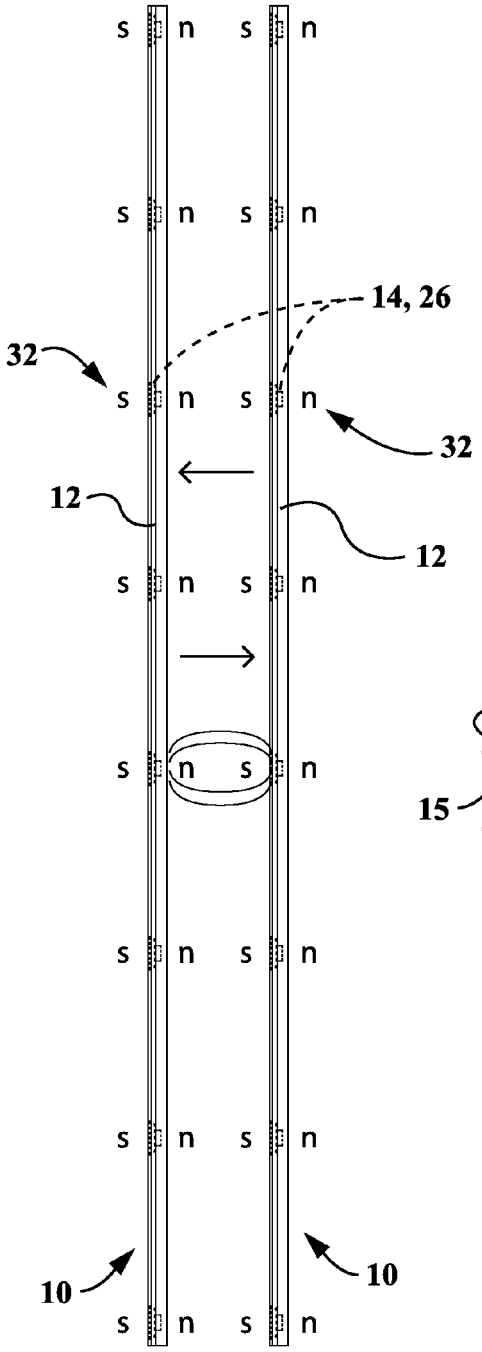
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FIG. 13

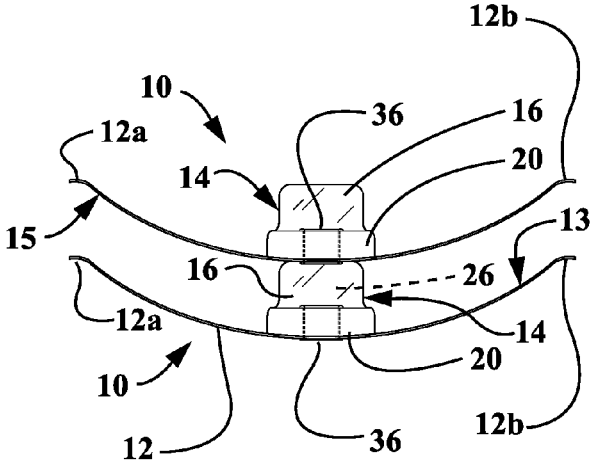
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FIG. 14

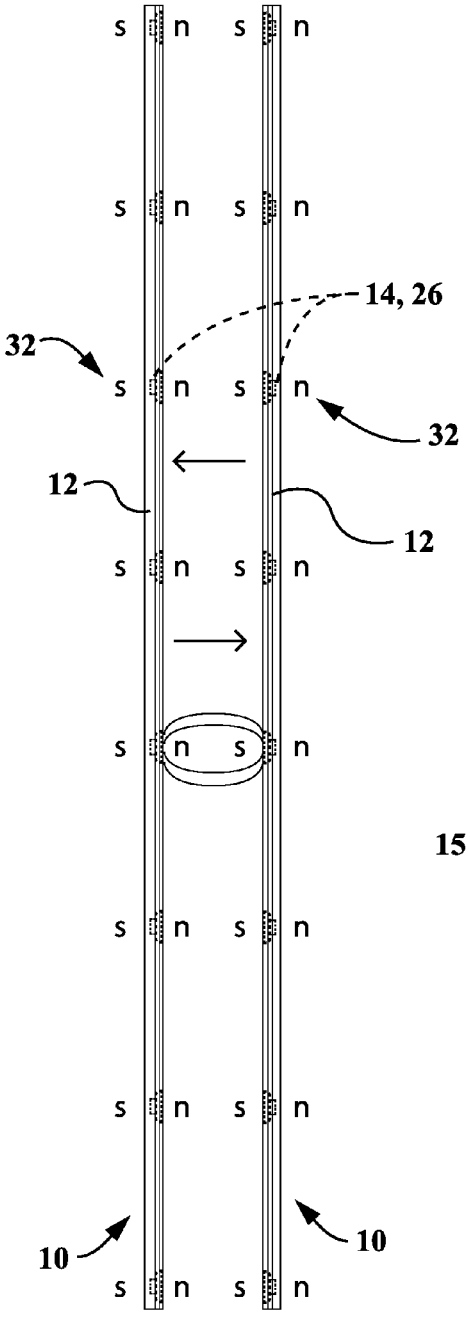
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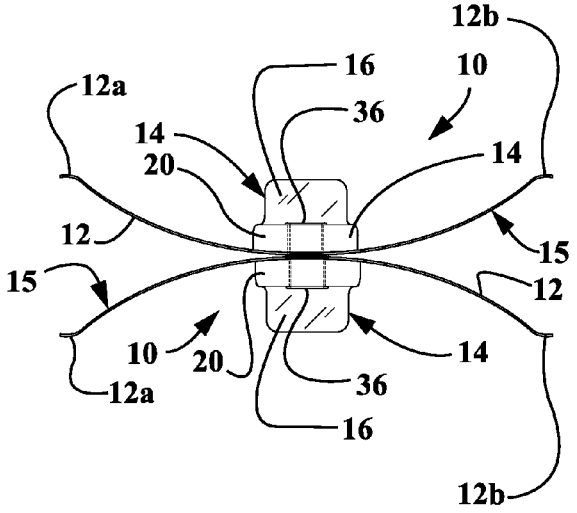
FIG. 15


12b
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12a
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12b

FIG. 16

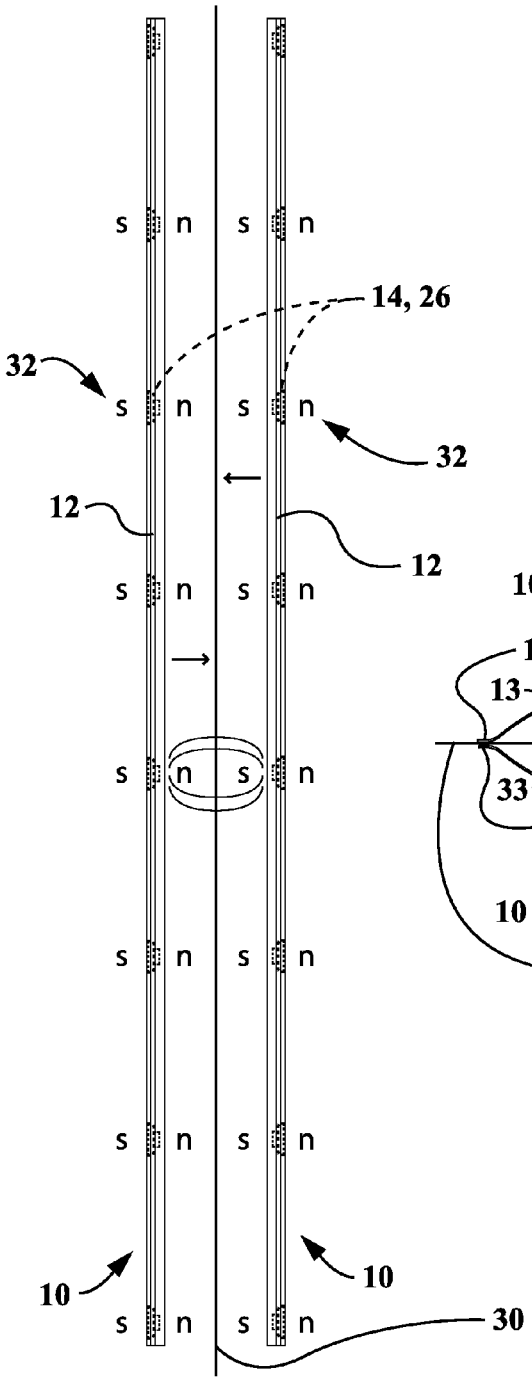
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FIG. 17

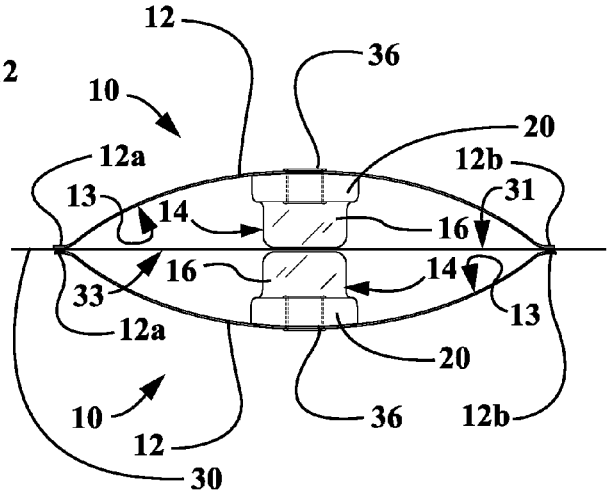
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FIG. 18

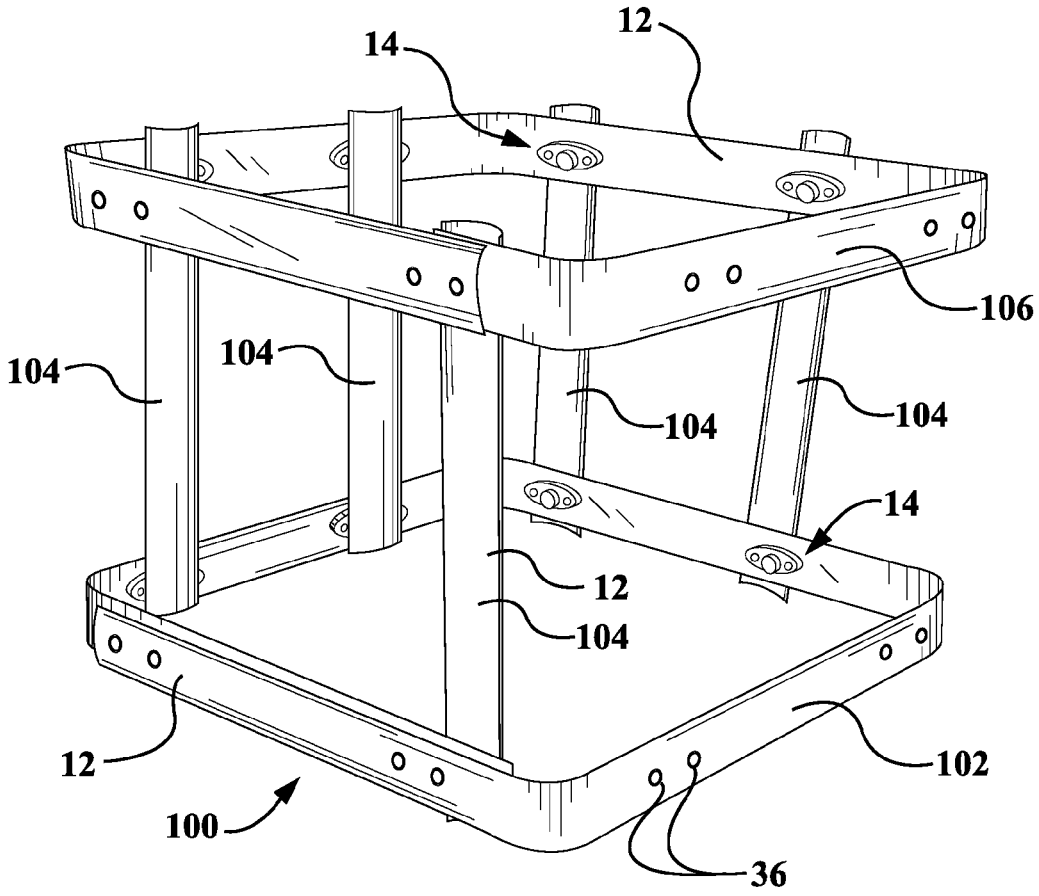

FIG. 19

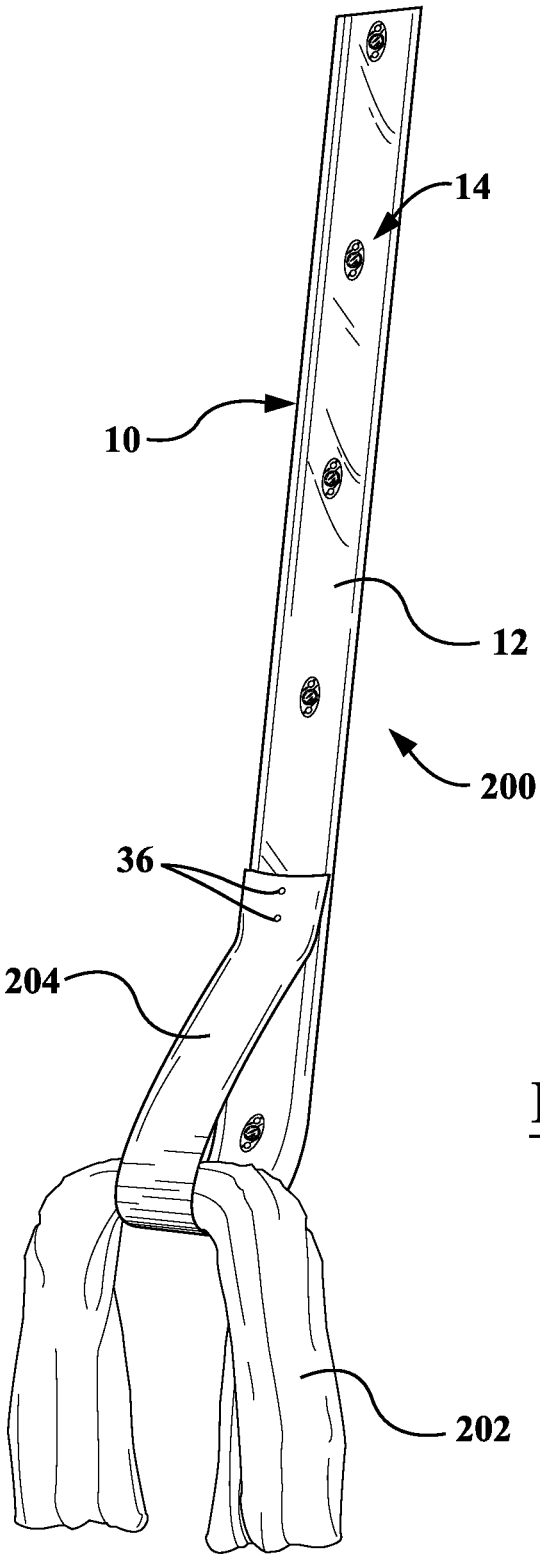

FIG. 20

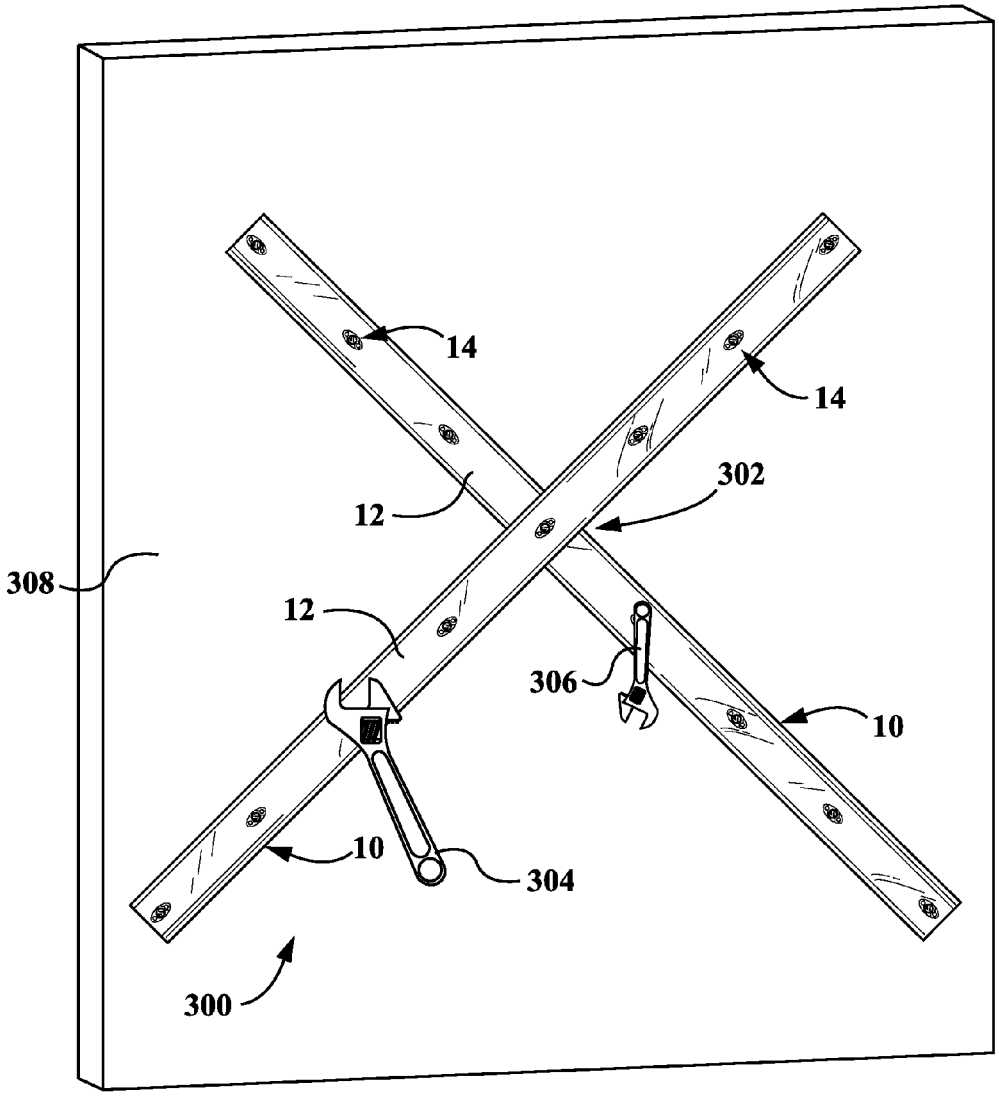

FIG. 21

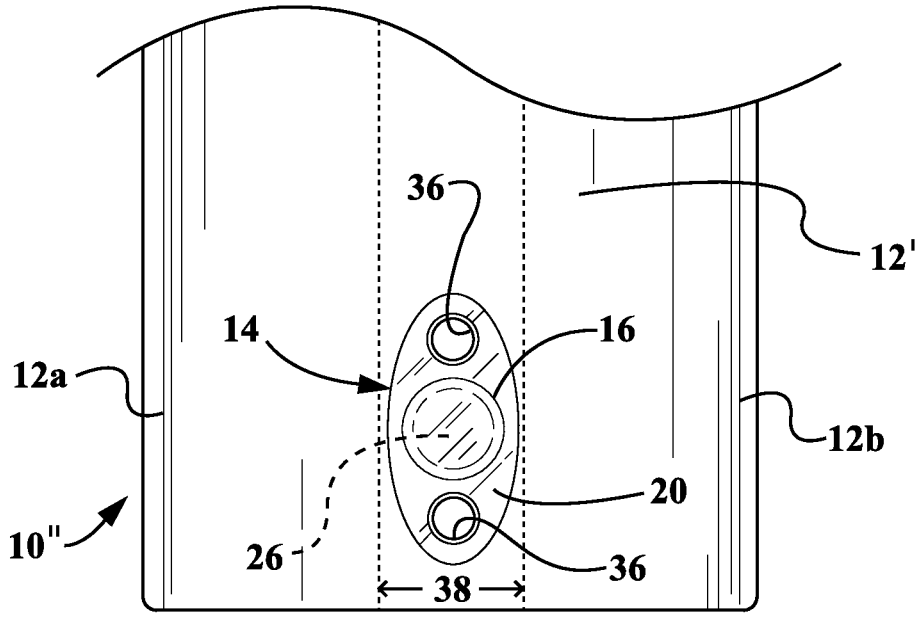

FIG. 22A

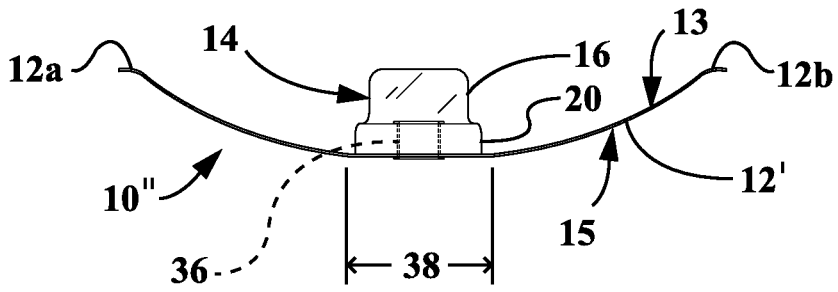

FIG. 22B

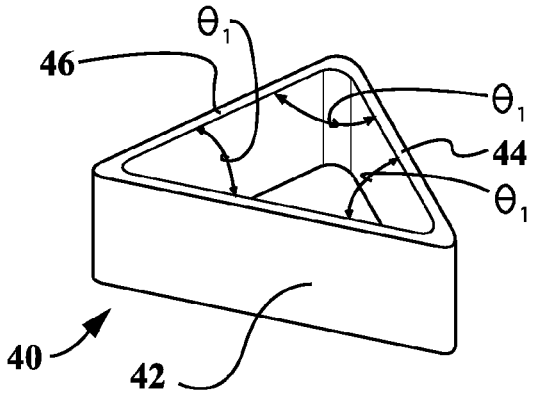

FIG. 23

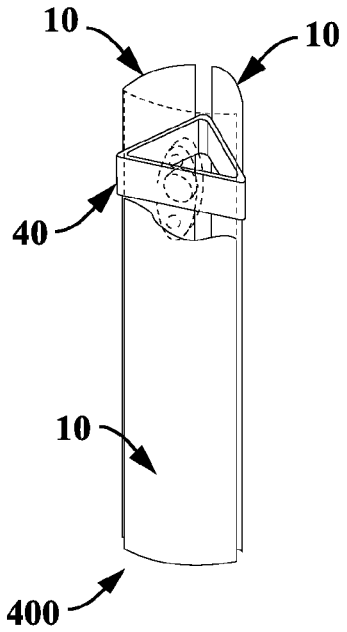

FIG. 24

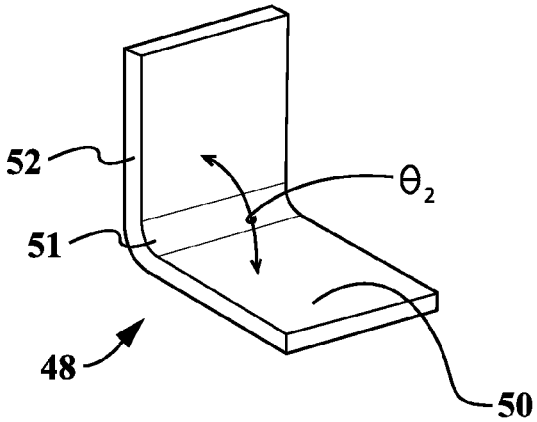

FIG. 25

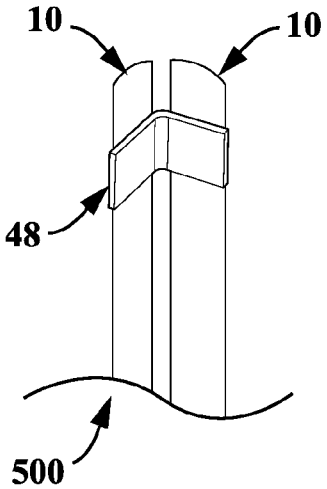

FIG. 26

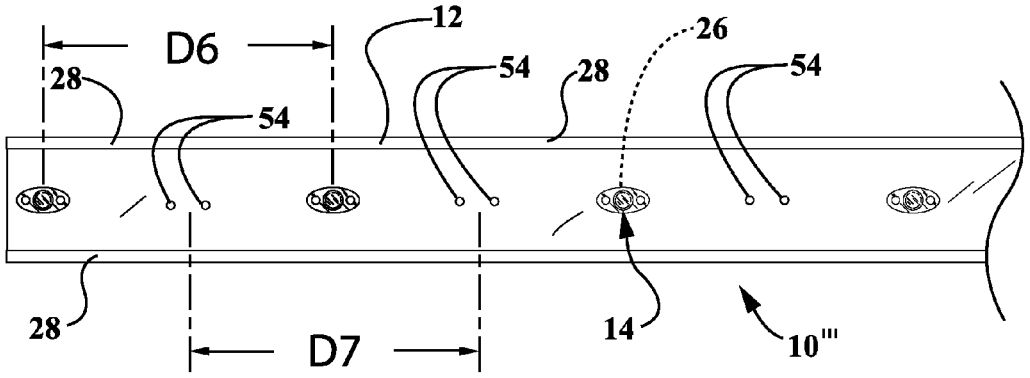

FIG. 27

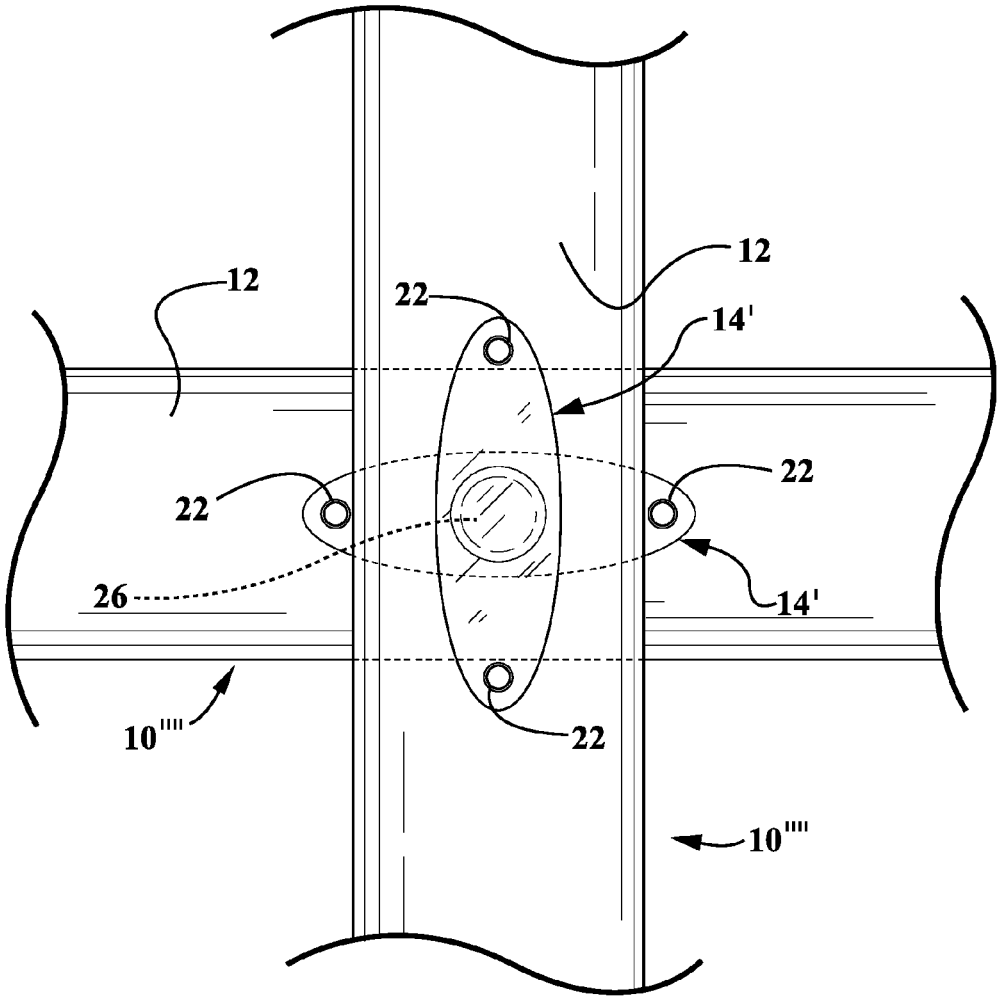

FIG. 28

MAGNETIC SLAT DEVICE AND KIT CONTAINING THE SAME

CROSS-REFERENCE TO RELATED APPLICATIONS

This patent application claims priority to, and incorporates by reference in its entirety, U.S. Provisional Patent Application No. 61/720,250, entitled "APP SLATTS AND MAGNESLATTS", filed on Oct. 30, 2012.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable.

NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT

Not Applicable.

INCORPORATION BY REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISK

Not Applicable.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention generally relates to slat devices. More particularly, the invention relates to a magnetic slat device and a kit containing the same.

2. Background

Many tools, and other objects, including conventional slats of multiple varieties, are designed for one or two specific functions. As such, a person may have to spend a great deal of money to buy the items needed to complete a wide variety of tasks. Others may spend a great deal of time personally manufacturing items that perform these various actions. Even those that find themselves able to afford a wide range of tools and objects to complete a wide array of tasks may find themselves lacking the space required to store such tools and objects. Some others may require a specialized device for emergency or time-sensitive situations, yet the price of such specialized items may be cost-prohibitive.

Therefore, what is needed is a slat device that that provides a streamlined solution, and is capable of being flexibly used in various applications. Moreover, a slat device is needed that can be combined with other similar slat devices so that a myriad of different structures can be constructed therewith. Furthermore, there is a need for a slat device, which is provided as a component of a slat kit, that can be easily assembled with the other components of the kit to form various structures that are particularly suited to a user's specific needs.

BRIEF SUMMARY OF EMBODIMENTS OF THE INVENTION

Accordingly, the present invention is directed to a magnetic slat device and a kit containing the same that substantially obviates one or more problems resulting from the limitations and deficiencies of the related art.

In accordance with one or more embodiments of the present invention, there is provided a magnetic slat device, which includes: an elongate slat body, the elongate slat body having a generally curved cross-section with a first generally concave surface and a second generally convex surface, the elongate slat body further including a first longitudinal edge portion and a second longitudinal edge portion disposed opposite to the first longitudinal edge portion; and a plurality of magnets coupled to the elongate slat body, each of the plurality of magnets being spaced apart from one another along a length of the elongate slat body, and each of the plurality of magnets being disposed between the first and second longitudinal edge portions of the elongate slat body. In these one or more embodiments, each of the plurality of magnets is configured to exert a magnetic force on a magnetic object.

In a further embodiment of the present invention, at least one of the plurality of magnets is coupled to the elongate slat body by means of a magnet mounting member, the magnet mounting member including a recess for receiving the magnet.

In yet a further embodiment, the magnet mounting member further includes a central body portion and a peripheral flange portion, the central body portion of the magnet mounting member comprising the recess for receiving the magnet.

In still a further embodiment, the peripheral flange portion of the magnet mounting member comprises one or more apertures for accommodating a fastener passing therethrough.

In yet a further embodiment, the magnetic slat device further comprises a respective fastener passing through each of the one or more apertures in the peripheral flange portion of the magnet mounting member, each fastener securing the magnet to the elongate slat body.

In still a further embodiment, each of the first and second longitudinal edge portions of the elongate slat body comprise bent edge portions that extend outwardly from the elongate slat body in generally opposite directions.

In yet a further embodiment, each of the bent edge portions comprises an edge cover formed from a resilient material.

In still a further embodiment, each of the plurality of magnets comprises a first surface and a second surface disposed opposite to the first surface, the second surface of each of the plurality of magnets being disposed contiguous to the first generally concave surface of the elongate slat body.

In yet a further embodiment, each of the bent edge portions comprises a first surface that is connected to the first generally concave surface of the elongate slat body and a second surface that is connected to the second generally convex surface of the elongate slat body, the first surface of each of the bent edge portions being disposed opposite to the second surface of each of the bent edge portions, and wherein the first surface of each of the plurality of magnets is spaced apart from the first surface of at least one of the bent edge portions by a predetermined distance such that none of the plurality of magnets protrude beyond the first surfaces of the bent edge portions when the elongate slat body is in an undeformed state.

In still a further embodiment, the elongate slat body is formed from a resilient and bendable material.

In yet a further embodiment, at least one of the plurality of magnets comprises a neodymium magnet.

In still a further embodiment, the elongate slat body further comprises a plurality of apertures passing therethrough, each of the plurality of apertures being spaced apart from one another along a length of the elongate slat body.

In yet a further embodiment, the plurality of apertures comprises a plurality of pairs of the apertures, a first aperture of each of the pairs of the apertures being disposed on a first side of a respective one of the plurality of magnets, and a

second aperture of each of the pairs of the apertures being disposed on a second side of a respective one of the plurality of magnets.

In still a further embodiment, the elongate slat body further comprises a generally flat region in a central portion of the generally curved cross-section.

In accordance with one or more other embodiments of the present invention, there is provided a magnetic slat device, which includes: an elongate slat body, the elongate slat body having a generally curved cross-section with a first generally concave surface and a second generally convex surface, the elongate slat body further including a first longitudinal edge portion, a second longitudinal edge portion disposed opposite to the first longitudinal edge portion, and a plurality of apertures being spaced apart from one another along a length of the elongate slat body; and a plurality of magnets coupled to the elongate slat body, each of the plurality of magnets being spaced apart from one another along a length of the elongate slat body, and each of the plurality of magnets being disposed between the first and second longitudinal edge portions of the elongate slat body. In these one or more other embodiments, each of the plurality of magnets is configured to exert a magnetic force on a magnetic object.

In accordance with yet one or more other embodiments of the present invention, there is provided a magnetic slat kit that comprises a plurality of magnetic slat devices. Each of the plurality of magnetic slat devices in the kit includes an elongate slat body, the elongate slat body having a generally curved cross-section with a first generally concave surface and a second generally convex surface, the elongate slat body further including a first longitudinal edge portion and a second longitudinal edge portion disposed opposite to the first longitudinal edge portion; and a plurality of magnets coupled to the elongate slat body, each of the plurality of magnets being spaced apart from one another along a length of the elongate slat body, and each of the plurality of magnets being disposed between the first and second longitudinal edge portions of the elongate slat body. In these one or more other embodiments, each of the plurality of magnetic slat devices is configured to be coupled to one another or to an external object by means of magnetic forces produced by the plurality of the magnets.

In a further embodiment of the present invention, a first device of the plurality of magnetic slat devices is configured to be coupled to a second device of the plurality of magnetic slat devices such that the first generally concave surface of the first device faces, in an opposing manner, the first generally concave surface of the second device and the plurality of magnets are encapsulated between the slat bodies of the first and second devices.

In yet a further embodiment, when the first and second devices are coupled to one another, the slat bodies of the first and second devices are each configured to resiliently deform such that at least a portion of a surface of each of the plurality of magnets of the first device lies contiguous to at least a portion of a surface of a respective one of the plurality of magnets of the second device.

In still a further embodiment, a first device of the plurality of magnetic slat devices is configured to be coupled to a second device of the plurality of magnetic slat devices such that the first generally concave surface of the first device faces, in an opposing manner, the second generally convex surface of the second device and the generally curved cross-sections of the first and second devices are disposed generally parallel to another.

In yet a further embodiment, the magnetic slat kit further comprises an elongate strengthening member having a first surface and a second surface disposed opposite to the first surface, the elongate strengthening member being formed from a generally rigid material; and wherein a first device of the plurality of magnetic slat devices is configured to be coupled to a second device of the plurality of magnetic slat devices and the elongate strengthening member such that the first generally concave surface of the first device faces, in an opposing manner, the first surface of the elongate strengthening member and the first generally concave surface of the second device faces, in an opposing manner, the second surface of the elongate strengthening member, and wherein the elongate strengthening member is sandwiched between the first and second devices.

It is to be understood that the foregoing general description and the following detailed description of the present invention are merely exemplary and explanatory in nature. As such, the foregoing general description and the following detailed description of the invention should not be construed to limit the scope of the appended claims in any sense.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

The invention will now be described, by way of example, with reference to the accompanying drawings, in which:

FIG. **1**A is a plan view of a magnetic slat device, according to one embodiment of the invention, wherein the generally concave surface of the magnetic slat device is illustrated;

FIG. **1**B is an end view of the magnetic slat device of FIG. **1**A;

FIG. **2**A is a partial enlarged plan view of an end of the magnetic slat device of FIGS. **1**A and **1**B (Detail "A");

FIG. **2**B is an enlarged end view of the magnetic slat device of FIGS. **1**A and **1**B (Detail "A");

FIG. **3** is an enlarged sectional view of the magnetic slat device of FIGS. **1**A and **1**B, which is generally cut along the cutting-plane line A-A in FIG. **2**A;

FIG. **4**A is a plan view of a magnetic slat device, according to another embodiment of the invention, wherein the longitudinal edge portions of the magnetic slat device are provided with edge covers disposed thereon;

FIG. **4**B is an end view of the magnetic slat device of FIG. **4**A;

FIG. **5**A is a partial enlarged plan view of an end of the magnetic slat device of FIGS. **4**A and **4**B (Detail "B");

FIG. **5**B is an enlarged end view of the magnetic slat device of FIGS. **4**A and **4**B (Detail "B");

FIG. **6** is an enlarged sectional view of the magnetic slat device of FIGS. **4**A and **4**B, which is generally cut along the cutting-plane line B-B in FIG. **5**A;

FIG. **7** is a partial enlarged sectional view of an edge portion of the magnetic slat device shown in FIG. **6** (Detail "C");

FIG. **8** is an end view of two magnetic slat devices disposed together, according to one embodiment of the invention, wherein the generally concave surfaces of the magnetic slat devices are facing one another, and wherein a slat body of each of the magnetic slat devices is in an undeformed state;

FIG. **9** is another end view of the two magnetic slat devices illustrated in FIG. **8**, wherein the slat body of each of the magnetic slat devices is in a deformed state such that the magnet mounting members of the magnetic slat device are touching one another;

FIG. **10** is yet another end view of two magnetic slat devices disposed together, which is similar to FIG. **9**, except that the longitudinal edge portions of the magnetic slat device are provided with edge covers disposed thereon;

FIG. **11** is a side view of two magnetic slat devices prior to being attached to one another, wherein the generally concave surfaces of the magnetic slat devices are facing one another;

FIG. **12** is an end view of two magnetic slat devices disposed together, which is generally the same as that shown in FIG. **9**;

FIG. **13** is a side view of two magnetic slat devices prior to being attached to one another, wherein the generally concave surface of a first magnetic slat device is facing the generally convex surface of a second magnetic slat device;

FIG. **14** is an end view of the two magnetic slat devices illustrated in FIG. **13** after being attached to one another, wherein the generally concave surface of the first magnetic slat device is facing the generally convex surface of the second magnetic slat device;

FIG. **15** is a side view of two magnetic slat devices prior to being attached to one another, wherein the generally convex surface of a first magnetic slat device is facing the generally convex surface of a second magnetic slat device;

FIG. **16** is an end view of the two magnetic slat devices illustrated in FIG. **15** after being attached to one another, wherein the generally convex surface of the first magnetic slat device is facing the generally convex surface of the second magnetic slat device;

FIG. **17** is a side view of two magnetic slat devices and an elongated strengthening member prior to being attached to one another, wherein the generally concave surfaces of the magnetic slat devices are each facing a respective opposed side of the elongated strengthening member;

FIG. **18** is an end view of the two magnetic slat devices illustrated in FIG. **17** after being attached to one another and to the elongated strengthening member, wherein the generally concave surfaces of the magnetic slat devices are each facing a respective opposed side of the elongated strengthening member, and the elongated strengthening member is sandwiched between the two magnetic slat devices;

FIG. **19** is a perspective view of an exemplary structure that can be created using a plurality of magnetic slat devices, according to one embodiment of the invention;

FIG. **20** is a perspective view of an exemplary hanging loop that can be created using a magnetic slat device, according to one embodiment of the invention;

FIG. **21** is a perspective view of an exemplary hanging structure that can be created using a plurality of magnetic slat devices, according to one embodiment of the invention;

FIG. **22**A is a partial enlarged plan view of an end of a magnetic slat device, according to another embodiment of the invention, wherein the slat body of the magnetic slat device comprises a generally flat region;

FIG. **22**B is an enlarged end view of the magnetic slat device of FIG. **22**A;

FIG. **23** is a perspective view of a triangular connecting member for connecting a plurality of magnetic slat devices together;

FIG. **24** is a partial cutaway perspective view illustrating a plurality of magnetic slat devices connected together using the triangular connecting member of FIG. **23**;

FIG. **25** is a perspective view of an L-shaped connecting member for connecting a plurality of magnetic slat devices together;

FIG. **26** is a partial perspective view illustrating a plurality of magnetic slat devices connected together using the L-shaped connecting member of FIG. **25**;

FIG. **27** is a partial plan view of a magnetic slat device, according to yet another embodiment of the invention, wherein the slat body is provided with spaced apart pairs of apertures disposed therein; and

FIG. **28** is a partial plan view of two intersecting magnetic slat devices, according to still another embodiment of the invention, wherein the slat bodies are provided with elongated magnetic mounting members having apertures disposed therein, the apertures being spaced apart from one another by a distance that is slightly greater than the width of the slat body.

Throughout the figures, the same parts are always denoted using the same reference characters so that, as a general rule, they will only be described once.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

A first exemplary embodiment of the magnetic slat device is seen generally at **10** in FIGS. **1**-**3**. Initially, referring to FIGS. **1**A-**2**B, it can be seen that the magnetic slat device **10** generally comprises an elongate slat body **12**, the elongate slat body **12** having a generally curved cross-section (see FIG. **2**B) with a first generally concave surface **13** and a second generally convex surface **15**, the elongate slat body **12** further including a first longitudinal edge portion **12***a* and a second longitudinal edge portion **12***b* disposed opposite to the first longitudinal edge portion **12***a*; and a plurality of magnets **26** coupled to the elongate slat body **12**, each of the plurality of magnets **26** being spaced apart from one another along a length of the elongate slat body **12** (see FIG. **1**A), and each of the plurality of magnets **26** being disposed between the first and second longitudinal edge portions **12***a*, **12***b* of the elongate slat body **12**. Each of the plurality of magnets **26** of the magnetic slat device **10** is configured to exert a magnetic force on a magnetic object, such as another magnetic slat device or a metal sheet.

In the illustrated embodiment, it can be seen that the first and second longitudinal edge portions **12***a*, **12***b* of the elongate slat body **12** comprise bent edge portions (see FIGS. **2**B and **3**) that extend outwardly from the elongate slat body **12** in generally opposite directions (i.e., the bent edge portions **12***a*, **12***b* of the elongate slat body **12** are spaced apart from one another by approximately 180 degrees). With particular reference to FIG. **3**, it can be seen that each of the bent edge portions **12***a*, **12***b* comprises a first surface **17** that is connected to the first generally concave surface **13** of the elongate slat body **12** and a second surface **19** that is connected to the second generally convex surface **15** of the elongate slat body **12**. The first surface **17** of each of the bent edge portions **12***a*, **12***b* is disposed generally opposite to the second surface **19** of each of the bent edge portions **12***a*, **12***b*. In some embodiments, the elongate slat body **12** is provided with one or more strips of photoluminescent tape disposed along the length thereof (e.g., on the second generally convex surface **15** of the slat body **12**). Advantageously, a slat device **10** provided with photoluminescent tape disposed thereon can be used to illuminate an area for safety or convenience.

The elongate slat body **12** can be formed using various suitable materials. For example, the elongate slat body **12** could be made from a suitable metal or polymer. Although, the material selected for the elongate slat body **12** is preferably both resilient and bendable so that the magnetic slat device **10** can be bent into a plurality of different shapes for various applications, but then, is capable of regaining its original, generally linear shape after being removed from its deformed arrangement.

As best shown in FIG. **1**A, and in the enlarged views of FIGS. **2**A and **2**B, each of the plurality of plurality of magnets **26** is attached to the elongate slat body **12** by means of a magnet mounting member **14** in the illustrative embodiment.

Referring to the sectional view of FIG. **3**, it can be seen that each magnet mounting member **14** includes a recess **18** (e.g., a cylindrical recess) for receiving its respective magnet **26** (e.g., a respective cylindrical magnet). Each magnet mounting member **14** further includes a central body portion **16** and a peripheral flange portion **20** (see e.g., FIGS. **2**A and **2**B) and a slightly curved surface **24** (see FIG. **3**) that lies contiguous to the first generally concave surface **13** of the slat body **12**. The recess **18** receiving the magnet **26** is disposed in the central body portion **16** of the magnet mounting member **14**. In addition, as best illustrated in FIGS. **2**A and **2**B, the peripheral flange portion **20** of each magnet mounting member **14** comprises two oppositely disposed apertures **22** for accommodating a respective fastener passing therethrough (i.e., each magnet mounting member **14** comprises a pair of apertures). A first aperture of each pair of apertures **22** is disposed on a first side of a respective one of the plurality of magnets **26**, and a second aperture of each pair of apertures **22** is disposed on a second side of a respective one of the plurality of magnets **26**. In the embodiment of the invention illustrated in FIGS. **1-3**, fasteners in the form of rivets **36** (see e.g., FIGS. **2**A, **5**A, and **6**) are used for securing the magnet mounting members **14** to the slat body **12**. However, it is to be understood that other suitable fasteners, such as screws or bolts with nuts may be used for attaching the magnet mounting members **14** to the slat body **12**.

Also, in an alternative embodiment of the invention, the peripheral flange portion **20** of the magnet mounting member **14** may be provided without any fasteners disposed therethrough. In this alternative embodiment, each magnet mounting member **14** can be attached to the slat body **12** by using a suitable adhesive (e.g., a suitable glue).

Turning to the sectional view of FIG. **3**, it can be seen that each of the magnets **26** in the illustrated embodiment comprises a first surface **27** and a second curved surface **34** disposed generally opposite to the first surface **27**. Throughout the figures, the letters "n" and "s" denote the polarity **32** of the magnet **26**. In FIG. **3**, it can be seen that the first surface **27** of the magnet **26** corresponds to its north pole "n", while the second curved surface **34** of the magnet **26** corresponds to its south pole "s". In some embodiments, the shape and pole orientation of the magnets **26** is clearly marked using indicia on one of the surfaces **13**, **15** of the slat body **12**. As shown in this typical sectional view, the second curved surface **34** of each magnet **26** is disposed generally contiguous to the first generally concave surface **13** of the elongate slat body **12**. Also, referring to FIG. **3**, it can be seen that the first surface **21** of each magnet mounting member **14** is spaced apart from the first surfaces **17** of the bent edge portions **12***a*, **12***b* by a predetermined distance D**1** (e.g., 2 millimeters) such that none of the plurality of magnets **26** protrude beyond the first surfaces **17** of the bent edge portions **12***a*, **12***b* when the elongate slat body **12** is in an undeformed state. Similarly, the first surface **27** of each magnet **26** is spaced apart from the first surface **17** of the bent edge portions **12***a*, **12***b* by a predetermined distance (D**1** plus the thickness, e.g., 1 mm, of the top portion of the magnet mounting member **14** in FIG. **3**) such that none of the plurality of magnets **26** protrude beyond the first surfaces **17** of the bent edge portions **12***a*, **12***b* when the elongate slat body **12** is in an undeformed state.

In an exemplary embodiment of the invention, the magnets **26** comprise neodymium magnets. For example, the magnets **26** may be epoxy-coated neodymium iron boron and can be either ringed with, or cupped in stainless steel or another appropriate substance. Although, other suitable types of magnets may also be used provided that they are capable of producing a sufficiently strong magnetic force. Also, in the illustrated embodiment, it can be seen that the magnets **26** are generally cylindrical in shape (see e.g., FIGS. **2**A-**3**) with a curved second surface **34** that generally matches the contour of the first generally concave surface **13** (see FIG. **3**). However, it is to be understood that magnets having other suitable shapes may be also be utilized. For example, a magnet having a square or rectangular footprint with a generally flat second surface may be used in lieu of the illustrated cylindrical magnet. A magnet having a generally flat second surface is particularly suitable for use with a slat body **12** having a generally flat region **38**, as will be described hereinafter in conjunction with the embodiment of FIGS. **22**A and **22**B.

In one or more embodiments, the magnetic slat devices **10**, **10'**, **10"**, **10'"**, **10'** described herein are provided as part of a kit. For example, the magnetic slat kit may comprise a plurality of magnetic slat devices **10**, wherein each of the plurality of magnetic slat devices **10** may include the various features described in conjunction with the illustrative embodiments explained herein. In the magnetic slat kit, each of the plurality of magnetic slat devices **10** is configured to be coupled to one another or to an external object (e.g., a metallic object, such as a metal door or wall panel) by means of magnetic forces produced by the plurality of magnets **26** provided on the magnetic slat devices **10**. In addition to the magnetic slat devices **10**, **10'**, **10"**, **10'"**, **10""**, the slat kit may comprise other components that can be used as attachment devices and accessories for the magnetic slat devices. For example, the kit may be provided with peg members that are designed to fit into the apertures **54** in FIG. **27**. The peg members can be used to attach stacked slat devices so that slat devices can be layered on top of one another in an assembly. Advantageously, the layering of the slat devices would increase strength of the assembly. As another example, the kit may additionally comprise blank slats with apertures **54**, but no magnets disposed thereon, which can be connected to the magnetic slat devices **10** using the peg members or other suitable attachment means. Similar to the elongate strengthening members **30**, the blank slats could be used to strengthen the structure that is built with the magnetic slat devices **10**. As yet another example, the kit may comprise accessories that are designed to easily attach to the apertures **54** in the slat body **12**, such as: (i) motor modules with opposed peg members, (ii) power supply (battery) modules with opposed peg members, (iii) wheel modules including one or more wheels mounted thereon, and (iv) generator modules with opposed peg members for generating power for other accessories. In one embodiment, these accessories are sized so as to fit within the internal football-shaped cavity formed by the magnetic slat devices **10** illustrated in FIGS. **8-10** and **12**. Advantageously, the apertures **54** in the slat body **12** enable a vast array of interchangeable accessories to be used with the devices **10** described herein.

Next, with reference to FIGS. **8-18**, several exemplary ways in which the magnetic slat devices **10** can be connected together will be described. For example, a plurality of magnetic slat devices **10** provided as part of a magnetic slat kit can be connected together in these exemplary ways. Initially, referring to FIGS. **8-12**, it can be seen that a first magnetic slat device **10** can be attached to a second magnetic slat device **10** such that the first generally concave surface **13** of the first device **10** faces, in an opposing manner, the first generally concave surface **13** of the second device **10** and the plurality of magnets **26** in magnet mounting members **14** are encapsulated between the slat bodies **12** of the first and second devices **10** (see e.g., FIG. **9**). As shown in FIGS. **8** and **9**, when the magnetic slat devices **10** are connected together in this manner, the slat bodies **12** of the first and second devices **10** are

each configured to resiliently deform such that a surface **21** of each magnet mounting member **14** (or a surface of each magnet **26**, if exposed) of the first device **10** lies generally contiguous to a surface **21** of each magnet mounting member **14** (or to a surface of each magnet **26**, if exposed) of the second device **10**. For example, as explained above, the slat body **12** of magnetic slat device **10** can be formed from a resilient and bendable material that flexes when the magnet force(s) generated by the attraction of the north and south poles of the adjacent magnets **26** on the two devices **10** (see FIG. **11**) pull the two devices **10** together in a generally football-shaped, cross-sectional configuration (refer to FIGS. **9**, **10**, and **12**). In FIGS. **11**, **13**, **15**, and **17**, oval-shaped magnetic field lines are disposed between the north and south poles of one set of the magnets **26** (i.e., between the fourth set of magnets **26** located up from the bottom of these figures) to diagrammatically illustrate the magnetic attractive forces of the north and south poles of the adjacent magnets **26** on the two devices **10**.

In FIG. **8**, the slat bodies **12** of each magnetic slat device **10** are not yet deformed or flexed by the magnetic attraction forces of the magnets **26**. In the undeformed state, a gap distance D**3** (e.g., 1-2 mm) exists between the surfaces **21** of the magnet mounting members **14**. The distance D**3** is the flexure amount of the slat bodies **12** when they compressed together by the magnetic attraction forces of the magnets **26**. The gap distance D**3** is equal to the difference between the distance D**4**, which is measured from the topmost point of the unflexed upper device **10** in FIG. **8** to the bottommost point of the unflexed lower device **10** in FIG. **8**, and the distance D**5**, which is measured from the topmost point of the flexed upper device **10** in FIG. **9** to the bottommost point of the flexed lower device **10** in FIG. **9** (i.e., the gap distance D**3** is equal to the distance D**4** minus the distance D**5**). As illustrated in FIGS. **8** and **9**, the slat bodies **12** flex so that the surfaces **21** of the magnet mounting members **14** touch (or so that the surfaces **27** of the magnets **26** nearly touch one another, as they are just separated by the covering thickness of the magnet mounting members **14**). When the slat bodies **12** flex, and the surfaces **21** of the magnet mounting members **14** touch one another (see FIG. **9**), the composite structure formed by the two magnetic slat devices **10** becomes stronger as their longitudinal edge portions **12***a*, **12***b* are pressed against one another.

The composite structure of FIG. **10** is similar to that of FIG. **9**, except that the longitudinal edge portions **12***a*, **12***b* of the slat bodies **12** are each provided with edge covers **28** disposed thereon. For example, the edge covers **28** can be formed from an elastomeric material (e.g., rubber strips with pockets) that is fitted over the longitudinal edge portions **12***a*, **12***b*. Similar to that described above with regard to FIG. **9**, when the slat bodies **12** flex as a result of the magnetic attraction forces generated by magnets **26**, the longitudinal edge portions **12***a*, **12***b* with edge covers **28** are pressed against one another. If the edge covers **28** are formed from a resilient material, such as rubber, the edge covers **28** are capable of forming a water barrier (e.g., to prevent the intrusion of water into the internal football-shaped cavity containing the magnet mounting members **14**) when one of the rubber edge covers **28** is firmly pressed against the other of the edge covers **28**.

Referring to FIGS. **13** and **14**, it can be seen that, in another embodiment of the invention, a first magnetic slat device **10** can be attached to a second magnetic slat device **10** such that the first generally concave surface **13** of the first device **10** (e.g., located on the bottom in FIG. **14**) faces, in an opposing manner, the second generally convex surface **15** of the second device **10** (e.g., located on the top in FIG. **14**). As shown in the end view of FIG. **14**, the generally curved cross-sections of the first and second magnetic slat devices **10** are disposed generally parallel to one another when they are attached in this manner.

Now, with reference to FIGS. **15** and **16**, it can be seen that, in yet another embodiment of the invention, a first magnetic slat device **10** can be attached to a second magnetic slat device **10** such that the second generally convex surface **15** of the first device **10** (e.g., located on the bottom in FIG. **16**) faces, in an opposing manner, the second generally convex surface **15** of the second device **10** (e.g., located on the top in FIG. **16**). As shown in the end view of FIG. **16**, the cross-sections of the first and second magnetic slat devices **10** together form a generally flattened X-type configuration.

Then, referring to FIGS. **17** and **18**, it can be seen that, in still another embodiment of the invention, the magnetic slat kit may further comprise an elongate strengthening member **30** having a first generally planar surface **31** and a second generally planar surface **33** disposed opposite to the first surface **31**. In one or more exemplary embodiments, the elongate strengthening member **30** is formed from a generally rigid material, such as metal or a rigid plastic, so that it can increase the overall structural rigidity of the magnetic slat devices **10** that are connected together. In FIGS. **17** and **18**, it can be seen that a first magnetic slat device **10** can be attached to a second magnetic slat device **10**, and to the elongate strengthening member **30**. As shown in the end view of FIG. **18**, in this configuration, the first generally concave surface **13** of the first device **10** (e.g., located on the top in FIG. **18**) faces, in an opposing manner, the first surface **31** of the elongate strengthening member **30** and the first generally concave surface **13** of the second device **10** (e.g., located on the bottom in FIG. **18**) faces, in an opposing manner, the second surface **33** of the elongate strengthening member **30**. As such, the elongate strengthening member **30** is sandwiched between the first and second magnetic slat devices **10**. The configuration of the first and second magnetic slat devices **10** in FIG. **18** is similar to that of FIGS. **8-10** and **12**, except that the elongate strengthening member **30** is sandwiched between the first and second magnetic slat devices **10** in order to provide additional structural rigidity.

A second exemplary embodiment of the magnetic slat device is seen generally at **10'** in FIGS. **4A-7**. Referring to these figures, it can be seen that, in many respects, the second exemplary embodiment is similar to that of the first embodiment. Moreover, many elements are common to both such embodiments. For the sake of brevity, the elements that the second embodiment of the magnetic slat device has in common with the first embodiment will not be discussed because these components have already been explained in detail above. Furthermore, in the interest of clarity, these elements are denoted using the same reference characters that were used in the first embodiment.

In the second exemplary embodiment, as shown in FIGS. **4A-7**, each of the bent edge portions **12***a*, **12***b* of the slat body **12** is provided with an edge cover **28** disposed thereon. In all other respects, the magnetic slat device **10'** is generally the same as the magnetic slat device **10**. In one or more embodiments, each edge cover **28** is formed from a resilient material, such as a deformable polymeric material (e.g., rubber), that can be fitted over each bent edge portion **12***a*, **12***b*. As shown in the sectional view of FIG. **6**, it can be seen that the first surface **21** of each magnet mounting member **14** is spaced apart from the uppermost surface of the edge covers **28** by a predetermined distance D**2** (e.g., 2 millimeters) such that none of the magnet mounting members **14** or the plurality of magnets **26** protrude beyond the uppermost surfaces of the

edge covers **28** when the elongate slat body **12** is in an undeformed state. Advantageously, when the magnetic slat device **10** is attached to a vertically extending surface, the polymeric edge covers **28** (e.g., rubber edge covers **28**) increase the grip of the magnetic slat device **10** on the vertical surface by increasing the frictional surface contact therewith. This is particularly important when heavy objects are being hung from the magnetic slat device(s) **10** (see e.g., FIG. **21**). Advantageously, the curved cross-section of the magnetic slat devices **10** also greatly enhances the surface contact of the magnetic slat devices **10** with such a vertical surface because, not only do the central body portions **16** of the magnet mounting members **14** contact the vertical surface, but the longitudinal edge portions **12***a*, **12***b* of the slat body **12** additionally contact the vertical surface, thereby increasing the frictional contact therewith.

A third exemplary embodiment of the magnetic slat device is seen generally at **10"** in FIGS. **22**A-**22**B. Referring to these figures, it can be seen that, in many respects, the third exemplary embodiment is similar to that of the preceding two embodiments. Moreover, many elements are common to all of the embodiments. For the sake of brevity, the elements that the third embodiment of the magnetic slat device has in common with the first and second embodiments will not be discussed because these components have already been explained in detail above. Furthermore, in the interest of clarity, these elements are denoted using the same reference characters that were used in the first and second embodiments.

In the third exemplary embodiment, as shown in FIGS. **22**A-**22**B, the elongate slat body **12'** of the magnetic slat device **10"** is provided with a generally flat region **38** in a central portion of the generally curved cross-section. As best illustrated in the end view of FIG. **22**B, the generally flat region **38** comprises a generally planar surface (i.e., a flat linear plate-like surface). In all other respects, the magnetic slat device **10"** is generally the same as the magnetic slat device **10**. Advantageously, the generally flat region **38** of the slat body **12'** enables magnets **26** with generally flat second surfaces to be used, rather than curved second surfaces **34** as described above. Also, the generally flat region **38** of the slat body **12'** enables magnet mounting members **14** with generally flat second surfaces to be utilized, rather than the slightly curved second surfaces **24** explained above. As such, providing a generally flat region **38** on the elongate slat body **12'**, would likely reduce the material and/or labor costs associated with the magnets **26** and the magnet mounting members **14**, but may result in a consequential increase in the material and/or labor costs of the elongate slat body **12'**. Also, providing a generally flat region **38** on the elongate slat body **12'** makes it much easier to use one-quarter (¼) inch cube magnets that are arranged in a Halbach array or arrangement. In one or more embodiments, a series of magnets are arranged in varying orientations in a Halbach array so that an extremely strong magnetic field is created on one side of the magnetic slat device **10**, while a relatively weak magnetic field is created on the opposite side of the magnetic slat device **10**. A magnetic slat device **10** having a Halbach array of magnets **26** disposed thereon is beneficial in electromagnetic levitation applications of the device. In addition, providing a generally flat region **38** on the elongate slat body **12'** makes it much easier to use the magnetic slat devices **10** in applications requiring the formation of a track assembly therefrom (e.g., to accommodate wheels of automated devices, such as robots, etc.).

In an exemplary embodiment, the generally flat region **38** of the slat body **12'** has a width of approximately one-quarter (¼) of an inch. Although, it is to be understood that other suitable widths for the generally flat region **38** may also be used.

A fourth exemplary embodiment of the magnetic slat device is seen generally at **10'"** in FIG. **27**. Referring to this figure, it can be seen that, in many respects, the fourth exemplary embodiment is similar to that of the preceding three embodiments. Moreover, many elements are common to all of the embodiments. For the sake of brevity, the elements that the fourth embodiment of the magnetic slat device has in common with the preceding embodiments will not be discussed because these components have already been explained in detail above. Furthermore, in the interest of clarity, these elements are denoted using the same reference characters that were used in the preceding three embodiments.

In the fourth exemplary embodiment, as shown in the partial plan view of FIG. **27**, the elongate slat body **12** further comprises a plurality of apertures **54** passing therethrough. In FIG. **27**, it can be seen that the apertures **54** are arranged together in pairs, wherein the centerlines between apertures **54** of each pair are spaced by a predetermined distance D**7**. In other words, each of the plurality of apertures **54** is spaced apart from one another along a length of the elongate slat body by a predetermined distance D**7** (i.e., the first apertures of each pair are spaced apart from one another by a distance D**7** and the second apertures of each pair are spaced apart from one another by a distance D**7**). In one exemplary embodiment, the predetermined distance D**7** between the centerlines of paired apertures **54** is approximately six (6) inches. Although, those of ordinary skill in the art will appreciate that other suitable distance values may also be used for the predetermined distance D**7**, such as three (3) inches.

In one or more embodiments, when the magnetic slat devices **10'"** are provided as part of a slat kit, it is to be understood that the spacing between apertures **54** is standardized among the slat devices provided in the kit so that the slat devices could be easily connected to one another to build a desired structure. For example, when slat devices having a smaller width (e.g., ¼ inch) are provided in conjunction with slat devices having a larger width (e.g., 1 inch), the smaller width slat devices are provided with the same aperture **54** pattern as the larger width slat devices.

Referring again to FIG. **27**, it can be seen that the centerlines of the magnet mounting members **14** are spaced apart from one another by a predetermined distance D**6**. In one exemplary embodiment, the predetermined distance D**6** between the centerlines of magnet mounting members **14** is approximately six (6) inches. Although, those of ordinary skill in the art will appreciate that other suitable distance values may also be used for the predetermined distance D**6**, such as three (3) inches or twelve (12) inches.

A fifth exemplary embodiment of the magnetic slat device is seen generally at **10'"'** in FIG. **28**. Referring to this figure, it can be seen that, in many respects, the fifth exemplary embodiment is similar to that of the preceding four embodiments. Moreover, many elements are common to all of the embodiments. For the sake of brevity, the elements that the fifth embodiment of the magnetic slat device has in common with the preceding embodiments will not be discussed because these components have already been explained in detail above. Furthermore, in the interest of clarity, these elements are denoted using the same reference characters that were used in the preceding four embodiments.

In the fifth exemplary embodiment, as shown in the partial plan view of FIG. **28**, two magnetic slat devices **10'"'** are shown intersecting one another. As shown in this figure, each

of the slat bodies **12** of the magnetic slat devices **10""** is provided with elongated magnetic mounting members **14'** having apertures **22** disposed therein. The flange portion of each magnetic mounting member **14'** is elongated, as compared to the previously described magnetic mounting members **14**, in order to produce a greater spacing distance between the apertures **22**. In particular, the apertures **22** are spaced apart from one another by a distance that is slightly greater than the width of the slat body **12** (e.g., 1 1/16 inches for a 1 inch wide slat device or 7/8 of an inch for a 3/4 inch wide slat device). Advantageously, this enables the apertures **22** of the elongated magnetic mounting members **14'** to be used for fastening two intersecting magnetic slat devices **10""** to one another, as illustrated in FIG. **28**. For example, suitable fasteners, even string, can be disposed through the apertures **22** so as to secure one magnetic slat device **10""** to another. Also, the holes passing through the rivets **36** described above can be used for accommodating fastening means that secure the magnetic slat devices **10""** to one another (e.g., a string can pass through the holes in the rivets **36**).

A first exemplary structure that can be constructed using the magnetic slat devices **10**, **10'**, **10"**, **10'"**, **10""** described herein is seen generally at **100** in FIG. **19** (e.g., formed from magnetic slat devices that are furnished as part of a magnetic slat kit). As illustrated in FIG. **19**, the bottom base section **102** of the structure **100** can be formed by bending a flexible slat body **12** of a magnetic slat device **10** into a square shape. Similarly, the top frame section **106** of the structure **100** can be formed by bending a flexible slat body **12** of a magnetic slat device **10** into a square shape that is similar to that of the base section **102**. And, as shown in FIG. **19**, the top frame section **106** of the structure **100** can be elevated above the base section **102** by using a plurality of vertical support members **104** (i.e., formed from generally linear magnetic slat devices **10** that are unbent). While a total of five (5) vertical support members **104** are shown in FIG. **19**, it is to be understood that a fewer number (e.g., three) or a greater number (e.g., six or eight) vertical support members **104** can be used depending on the needs of a particular structure **100** (e.g., a greater number of vertical support members **104** would be required if the top frame section **106** was required to bear a great deal of weight).

A second exemplary structure that can be constructed using one of the magnetic slat devices **10**, **10'**, **10"**, **10'"**, **10""** described herein is seen generally at **200** in FIG. **20** (e.g., a magnetic slat device **10** that is furnished as part of a magnetic slat kit). As illustrated in FIG. **20**, the end portion **204** of a magnetic slat device **10** is bent into a loop configuration so that it is capable of holding an object, such as the towel or rag **202**. The looped end portion **204** of the magnetic slat device **10** can be formed by bending the flexible slat body **12** of the magnetic slat device **10** into the desired loop shape, and then, attaching the free end of the looped portion **204** to the generally straight portion of the slat body **12** (e.g., using rivets **36**, as illustrated in FIG. **20**).

A third exemplary structure that can be constructed using the magnetic slat devices **10**, **10'**, **10"**, **10'"**, **10""** described herein is seen generally at **300** in FIG. **21** (e.g., formed from magnetic slat devices that are furnished as part of a magnetic slat kit). As illustrated in FIG. **21**, two magnetic slat devices **10** can be arranged in an "X" configuration so as to form a tool hanging device **300**. In FIG. **21**, the two magnetic slat devices **10** intersect at a location **302**. Because each magnetic slat device **10** contains a plurality of magnets **26** disposed along the length thereof, the magnetic slat devices **10** adhere to a magnetic object, such as the metal panel or door **308** in FIG. **21**. As described above, the magnetic slat devices **10** are also attracted to each other. Using the tool hanging device **300** illustrated in FIG. **21**, a plurality of different tools (e.g., large adjustable crescent wrench **304** and small adjustable crescent wrench **306**) or other metallic objects can be easily hung from a metal wall panel **308**, or the like. In addition, non-metallic tools or other objects (e.g., with wood handles) also can be supported from the tool hanging device **300** by slipping a portion of the tool or object behind or between slat devices **10**, or by using the apertures **54** of the FIG. **27** embodiment to hang hooks from the slat devices **10**. This arrangement allows anything made from non-metallic materials, such as cloth, plastic or paper, to be easily supported using the device **300**.

Now, with reference to FIGS. **23-26**, exemplary connector members that can be used to attach magnetic slat devices **10** to one another will be described. Initially, referring to FIG. **23**, a first type of connecting member will be explained. As shown in this figure, the first type of slat connecting member **40** is triangular-shaped with a first side member **42**, a second side member **44**, and a third side member **46**. In the illustrated embodiment, the slat connecting member **40** is generally an equilateral triangle wherein an angle θ_1 between the side members **42**, **44**, **46** is approximately equal to 60 degrees. In FIG. **24**, it can be seen that the triangular-shaped connecting member **40** can be used to connect three (3) magnetic slat devices **10** together to form a composite structure **400** (i.e., a triangular-shaped beam member **400**).

Next, referring to FIG. **25**, a second type of connecting member will be explained. As shown in this figure, the second type of slat connecting member **48** is L-shaped with a first side member **50** and a second side member **52**. In the illustrated embodiment, the first and second side members **50**, **52** are disposed generally perpendicular to one another (i.e., forming an angle θ_2 equal to approximately 90 degrees). In FIG. **25**, it can also be seen that the first and second side members **50**, **52** are connected together by filleted or radiused portion **51**. Turning to FIG. **26**, it can be seen that the L-shaped slat connecting member **48** can be used to connect two (2) magnetic slat devices **10** together to form a composite structure **500** (i.e., a L-shaped beam member **500**).

In addition, it is to be understood that other types of connector members can be used to attach magnetic slat devices **10** to one another. For example, a clamshell-type connector clip with a spring-loaded hinge and two pins or prongs, which correspond to the paired apertures **54**, could be used to attach magnetic slat devices **10** in some embodiments of the invention. As another example, a two-piece connector clip with two pins or prongs, which correspond to the paired apertures **54**, could be used to attach magnetic slat devices **10** together (in both perpendicular and linear arrangements). Preferably, the internal curvature of the clamshell-type connector clip and two-piece connector clip would correspond to the curvature of the generally curved cross-section of the magnetic slat devices **10**.

It is readily apparent that the aforedescribed the magnetic slat devices **10**, **10'**, **10"**, **10'"**, **10""** and the kit containing the same offer numerous advantages. First, the magnetic slat devices **10**, **10'**, **10"**, **10'"**, **10""** provide a streamlined solution, and are each capable of being flexibly used in various applications. Secondly, the magnetic slat devices **10**, **10'**, **10"**, **10'"**, **10""** can be readily combined with one another so that a myriad of different structures can be constructed therewith. Finally, the magnetic slat devices **10**, **10'**, **10"**, **10'"**, **10"**, which can be provided as components of a slat kit, can be easily assembled with the other components of the kit to form various structures that are particularly suited to a user's specific needs.

Any of the features or attributes of the above described embodiments and variations can be used in combination with any of the other features and attributes of the above described embodiments and variations as desired.

Although the invention has been shown and described with respect to a certain embodiment or embodiments, it is apparent that this invention can be embodied in many different forms and that many other modifications and variations are possible without departing from the spirit and scope of this invention.

Moreover, while exemplary embodiments have been described herein, one of ordinary skill in the art will readily appreciate that the exemplary embodiments set forth above are merely illustrative in nature and should not be construed as to limit the claims in any manner. Rather, the scope of the invention is defined only by the appended claims and their equivalents, and not, by the preceding description.

The invention claimed is:

1. A magnetic slat device comprising, in combination:

an elongate slat body, said elongate slat body having a generally curved cross-section with a first generally concave surface and a second generally convex surface, said elongate slat body further including a first longitudinal edge portion and a second longitudinal edge portion disposed opposite to said first longitudinal edge portion; and

a plurality of magnets coupled to said elongate slat body, each of said plurality of magnets being spaced apart from one another along a length of said elongate slat body, and each of said plurality of magnets being disposed between said first and second longitudinal edge portions of said elongate slat body;

wherein each of said plurality of magnets is configured to exert a magnetic force on a magnetic object.

2. The magnetic slat device according to claim **1**, wherein at least one of said plurality of magnets is coupled to said elongate slat body by means of a magnet mounting member, said magnet mounting member including a recess for receiving said magnet.

3. The magnetic slat device according to claim **2**, wherein said magnet mounting member further includes a central body portion and a peripheral flange portion, said central body portion of said magnet mounting member comprising said recess for receiving said magnet.

4. The magnetic slat device according to claim **3**, wherein said peripheral flange portion of said magnet mounting member comprises one or more apertures for accommodating a fastener passing therethrough.

5. The magnetic slat device according to claim **4**, further comprising a respective fastener passing through each of said one or more apertures in said peripheral flange portion of said magnet mounting member, each said fastener securing said magnet to said elongate slat body.

6. The magnetic slat device according to claim **1**, wherein each of said first and second longitudinal edge portions of said elongated slat body comprises bent edge portions that extend outwardly from said elongate slat body in generally opposite directions.

7. The magnetic slat device according to claim **6**, wherein each of said bent edge portions comprises an edge cover formed from a resilient material.

8. The magnetic slat device according to claim **6**, wherein each of said plurality of magnets comprises a first surface and a second surface disposed opposite to said first surface, said second surface of each of said plurality of magnets being disposed contiguous to said first generally concave surface of said elongate slat body.

9. The magnetic slat device according to claim **8**, wherein each of said bent edge portions comprises a first surface that is connected to said first generally concave surface of said elongate slat body and a second surface that is connected to said second generally convex surface of said elongate slat body, said first surface of each of said bent edge portions being disposed opposite to said second surface of each of said bent edge portions, and wherein said first surface of each of said plurality of magnets is spaced apart from said first surface of at least one of said bent edge portions by a predetermined distance such that none of said plurality of magnets protrude beyond said first surfaces of said bent edge portions when said elongate slat body is in an undeformed state.

10. The magnetic slat device according to claim **1**, wherein said elongate slat body is formed from a resilient and bendable material.

11. The magnetic slat device according to claim **1**, wherein at least one of said plurality of magnets comprises a neodymium magnet.

12. The magnetic slat device according to claim **1**, wherein said elongate slat body further comprises a plurality of apertures passing therethrough, each of said plurality of apertures being spaced apart from one another along a length of said elongate slat body.

13. The magnetic slat device according to claim **12**, wherein said plurality of apertures comprises a plurality of pairs of said apertures, a first aperture of each of said pairs of said apertures being disposed on a first side of a respective one of said plurality of magnets, and a second aperture of each of said pairs of said apertures being disposed on a second side of a respective one of said plurality of magnets.

14. The magnetic slat device according to claim **1**, wherein said elongate slat body further comprises a generally flat region in a central portion of said generally curved cross-section.

15. A magnetic slat device comprising, in combination:

an elongate slat body, said elongate slat body having a generally curved cross-section with a first generally concave surface and a second generally convex surface, said elongate slat body further including a first longitudinal edge portion, a second longitudinal edge portion disposed opposite to said first longitudinal edge portion, and a plurality of apertures being spaced apart from one another along a length of said elongate slat body; and

a plurality of magnets coupled to said elongate slat body, each of said plurality of magnets being spaced apart from one another along a length of said elongate slat body, and each of said plurality of magnets being disposed between said first and second longitudinal edge portions of said elongate slat body;

wherein each of said plurality of magnets is configured to exert a magnetic force on a magnetic object.

16. A magnetic slat kit comprising, in combination:

a plurality of magnetic slat devices, each of said plurality of magnetic slat devices including:

an elongate slat body, said elongate slat body having a generally curved cross-section with a first generally concave surface and a second generally convex surface, said elongate slat body further including a first longitudinal edge portion and a second longitudinal edge portion disposed opposite to said first longitudinal edge portion; and

a plurality of magnets coupled to said elongate slat body, each of said plurality of magnets being spaced apart from one another along a length of said elongate slat body, and each of said plurality of magnets being

disposed between said first and second longitudinal edge portions of said elongate slat body;

wherein each of said plurality of magnetic slat devices is configured to be coupled to one another or to an external object by means of magnetic forces produced by said plurality of said magnets.

17. The magnetic slat kit according to claim **16**, wherein a first device of said plurality of magnetic slat devices is configured to be coupled to a second device of said plurality of magnetic slat devices such that said first generally concave surface of said first device faces, in an opposing manner, said first generally concave surface of said second device and said plurality of magnets are encapsulated between said slat bodies of said first and second devices.

18. The magnetic slat kit according to claim **17**, wherein, when said first and second devices are coupled to one another, said slat bodies of said first and second devices are each configured to resiliently deform such that at least a portion of a surface of each of said plurality of magnets of said first device lies contiguous to at least a portion of a surface of a respective one of said plurality of magnets of said second device.

19. The magnetic slat kit according to claim **16**, wherein a first device of said plurality of magnetic slat devices is configured to be coupled to a second device of said plurality of magnetic slat devices such that said first generally concave surface of said first device faces, in an opposing manner, said second generally convex surface of said second device and said generally curved cross-sections of said first and second devices are disposed generally parallel to another.

20. The magnetic slat kit according to claim **16**, further comprising an elongate strengthening member having a first surface and a second surface disposed opposite to said first surface, said elongate strengthening member being formed from a generally rigid material; and wherein a first device of said plurality of magnetic slat devices is configured to be coupled to a second device of said plurality of magnetic slat devices and said elongate strengthening member such that said first generally concave surface of said first device faces, in an opposing manner, said first surface of said elongate strengthening member and said first generally concave surface of said second device faces, in an opposing manner, said second surface of said elongate strengthening member, and wherein said elongate strengthening member is sandwiched between said first and second devices.

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